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The Neutrinos Angra experiment

The *Neutrinos Angra* experiment aims to measure the antineutrino flux from the reactor cores of the Angra dos Reis nuclear power plant. The main objective is to determine the reactor power and the nuclear fuel composition from the detected antineutrinos. Since this method could find application as a tool for nuclear safeguards and non-proliferation, the detector is designed to be safe, compact and cost-effective, according to reccomendations of the IAEA.

Neutrinos Angra employs a water Cherenkov detector. Its central component is the 1 m³ Target volume for the detection of antineutrinos via the inverse beta decay. This volume is doped with Gadolinium to observe the resulting neutron and thus create a characteristic coincidence signal. In addition the Target is surrounded by three veto volumes to reject cosmic muon events and other backgrounds. This is all the more important since the detector was planned as an above-ground experiment and will have no overburden. Currently the detector is set up and taking data at the CBPF in Rio de Janeiro, where it is placed for extensive testing. The acquired data has already been used to validate and characterize the PMTs and readout electronics as well as to assess the Target volume. It also allows a study of the cosmic muon flux and the rate of further background, which helps to improve the Monte Carlo simulations of the experiment. After the tests are concluded the detector will be shipped to Angra later this year.

Summary

The *Neutrinos Angra* experiment aims to measure the antineutrino flux from the reactor cores of the Angra dos Reis nuclear power plant. The main objective is to determine the reactor power and the nuclear fuel composition from the detected antineutrinos. Since this method could find application as a tool for nuclear safeguards and non-proliferation, the detector is designed to be safe, compact and cost-effective, according to reccomendations of the IAEA.

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